THE ZOOLOGIST.

THIRD SERIES.

VOL. XI.] MARCH, 1887. [No. 123.

ON THE FORMER EXISTENCE OF PTARMIGAN IN SOUTH-WEST SCOTLAND.

BY ROBERT SERVICE.

I HAVE long been aware, without thinking until lately that the fact had any special significance, that Ptarmigan used to be found on the higher summits of the range of hills that divides Kirkcudbrightshire and Dumfriesshire from the neighbouring counties of Ayr, Lanark, Peebles, and Selkirk. It has often been a matter of surprise to me that the former existence of these birds in this south-west corner of Scotland was never alluded to, even incidentally, by writers on Scottish Ornithology, with the single exception of the late Sir William Jardine (' Game Birds,' 1834). In no other ornithological work that I am aware of is the occurrence of Ptarmigan in these two counties mentioned, unless indeed Montagu's remark that "some few are yet to be found south of the Tweed" may be taken as applying here. But Montagu, who doubtless meant the statement to refer to Cumberland, was probably unaware, like a good many other Southrons, that a considerable and by no means unimportant portion of Scotland lies "south of the Tweed"! I had intended writing a note on the subject immediately after reading Mr. A. G. More's communication (Zool. 1881, p. 44), in which he endeavoured to show that the whole story of the former existence of Ptarmigan in Westmoreland and Cumberland was unreliable. Like other good resolutions, however, this intention of mine went out of mind until now, when in the course of beginning to take in hand the Ornithology of the

BRITISH MUSEUM

Scottish Solway district, the matter of Ptarmigan again came under notice. Believing this hitherto almost overlooked subject to be of more than local interest, and looking to the important bearing it has on the former occurrence (disputed in the meantime) of Ptarmigan in the English Lake district, I have deemed it advisable to lay the result of my enquiries before the readers of this journal.

There are four localities in which the former existence of Ptarmigan can be traced, *viz.*—(1) The mountains of Minnygaff parish; (2) the mountains in the parishes of Kells and Carsphairn; (3) the district surmounted by the peak of the Lowthers, on the dividing ridge betwixt Dumfriesshire and Lanarkshire; and (4) the district around Hartfell, at the head of Moffatdale. The first two localities are in Kirkcudbright, the last two are in Dumfries. These various localities are so nearly connected that I separate them only for the sake of treating the subject more clearly.

KIRKCUDBRIGHTSHIRE. Minnygaff. — The earliest notices of the Ptarmigan that I have been able to find in local literature are contained in Symson's 'Description of Galloway.' This work, written in 1684 at the request of Sir Robert Sibbald and forming part of the Sibbald MSS. deposited in the Advocate's Library in Edinburgh, was not printed until 1823. At page 79 there is an interesting paragraph, which I may be excused for quoting in full. Enumerating the natural productions of Galloway, Symson writes:—"As concerning animals I can say nothing save that in this countrey, consisting both of moors and valley grounds along the sea shore, we have such as are usualy found in the like places; as in the moors we have plenty of moor-fowles, partridges, *tarmakens*, &c. In our hills and boggs, foxes, good store. In our lochs and bourns, otters; near the sea severall sorts of wild geese, wild ducks, ateales, small teales, seamaws, gormaws, and an other fowl, which I know not the name of; it is about the bigness of a pigeon; it is black, and hath a red bill. I have seen it haunting about the Kirk of Mochrum." The bird which Symson describes in the latter portion of the passage is of course the Chough, which may still (though rapidly decreasing) be seen about the locality named. Several old MSS. relating to Galloway are printed as appendices to Symson's work. One of these is entitled 'Description of Minnygaff,' and forms part of the Macfarlane MSS., also in the Advocate's Library. This MS. appears to have been written in the early part of last century by Andrew Heron, of Bargaly, a famous botanist in his day. Heron (*op. cit.*, p. 132), referring to the mountain of Meyrick, states:—

"In the remote parts of this great mountain, are very large Red Deer; and about the top thereof, that fine bird, called the *Mountain Partridge*, or, by the commonalty, the *Tarmachan*, about the size of a Redcock, and its flesh much of the same nature: feeds, as that bird doth, on the seeds of the bullrush [?], and makes its protection in the chinks and hollow places of thick stones, from the insults of the eagles, which are in plenty, both the large gray and the black, about that mountain." Further on (p. 142), describing his own property of Bargaly, Heron says, "The land extends to Cairnsmure,* whereunto the greatest part of that mountain belongs, where there is good store of Bristol stone of divers colours, very well cutt naturally: very large Red-deer, with plenty of *mountain partridges* and other muirfowl." No one who has ever been on the Minnygaff Mountains can doubt their suitability as Ptarmigan-ground. The very name of the parish, which is from the Gaelic *monadh geodh*, signifying "the mountainous expanse full of deep hollows and chasms," is thoroughly descriptive of its aspect. Within the parish there are twelve peaks from 1500 to 2000 feet in height, and no less than ten peaks ranging from 2000 up to 2764 (Meyrick). There can be no doubt, from the number of people to be met with who have heard their forbears speak of Ptarmigan, that these birds were in former times comparatively abundant in the parish. I may name two individuals entitled to every credit, and their statements correspond with those of many others who might be cited if necessary. Mr. Erskine, gunsmith and game-dealer in Newton Stewart, who has been connected with guns, game, and gamekeepers all his life, as were his father and grandfather before him, says he well remembers hearing his grandfather, William Erskine, who died in 1820, tell of shooting Ptarmigan on Meyrick and other hills in Minnygaff. Mr. Thomas Galbraith, retired gamekeeper in Newton Stewart, who has been following his profession over these hills since 1827, informs me that no Ptarmigan have been seen in his time, but that he had known older keepers who had shot them; and that all the older keepers and shepherds then in the district when he began used to tell him of the former existence of Ptarmigan on the hill-tops, and regret their disappearance. In Harper's 'Rambles in Galloway' (p. 150) it is recorded that the last Ptarmigan shot in Galloway was killed on the Dungeon o' Buchan in 1820 by one of the Earl of Galloway's keepers. I have been told that this very bird was preserved by the then factor on the estate, but have been unable to verify the information. In the 'New Statistical Account' (Parish of Minnygaff, p. 120, 1842) it is stated that Ptarmigan were formerly common there, but had at that date disappeared. I think 1820 may be taken as the date of their extinction in the parish.

---

* Cairnsmore of Fleet, not Cairnsmore of Carsphairn, hereafter mentioned in this article.—R. S.

Kells and Carsphairn. — In these two parishes, the former of which marches with Minnygaff, traditions of the former existence of Ptarmigan abound, almost every elderly native being able to say that he had heard his father talk of the birds. In the 'Old Statistical Account' (Parish of Kells, vol. iv., p. 263, 1792) the Rev. John Gillespie states that Ptarmigan were at that time to be found on the high hills of Kells. The highest peak in the two parishes is Cairnsmore of Carsphairn, and here the birds seem to have been found until about 1818. Mr. Kennedy, of Knocknalling, in reply to my question, states that he had been informed by old Mr. M'Millan, tenant in Viewfield, that he had shot Ptarmigan on Cairnsmore in the winter of 1817-18, and sent them to Mr. Oswald, of Auchencruive. That winter Mr. M'Millan said was unusually severe, the snow lying far into the spring (a circumstance verified by local records), and that Ptarmigan were never afterwards seen or heard of in that district. Mr. Hastings, the well-known taxidermist in Dumfries, tells me that in 1835 (he is tolerably certain of the year) he was on Cairnsmore, and being anxious to ascertain if it was probable that any Ptarmigan were still on the mountain, he made some enquiries of the residents, and learnt from William Johnstone, a shepherd, who then lived at Burnfoot, of Carsphairn, that he had known the Ptarmigan all his life on the top of Cairnsmore; but they gradually dwindled away, and he had not seen a single bird during the previous fourteen or fifteen years. The shepherd was then apparently a man of over sixty years of age, and Mr. Hastings says he was greatly diverted at the time with the deep guttural and sonorous tone with which the shepherd uttered the word *torrmachan*—a rather remarkable confirmation of Heron of

Bargaly's somewhat supercilious reference to "the commonalty" and their name for the bird!

In the 'New Statistical Account' (Kells Parish, 1844, p. 110) it is stated, "Ptarmigan are extinct"; and again (*op. cit.*, Carsphairn Parish, 1844, p. 275), we find that "it is commonly said that the last place in the South of Scotland which the Ptarmigan frequented was Cairnsmuir. They have for some time, however, been completely destroyed or banished."

Dumfriesshire. The Lowthers and District.—On the Dumfriesshire side of the Nith, traditions relating to Ptarmigan are by no means so rife as in the Stewartry. I have not been able to ascertain anything at all definite in the way of traditionary record. It is pretty certain that the bulk of the stock of birds must have gone much sooner than those in Galloway, leaving only a few stragglers to linger into the present century. In the course of quest for information on this subject it occurred to me to search the old files of the local newspaper, the 'Dumfries and Galloway Courier,' and I was very kindly permitted to do this by the courtesy of the proprietor. I was aware that the late Mr. John M'Diarmid, who was for about fifty years the editor, was intimately acquainted with the denizens of all our mountains and glens, and a naturalist of repute, as is abundantly testified by his published 'Sketches from Nature,' and the constant references made to the standard authors of that day, such as Pennant, Latham, Lewin, Montagu, Willughby, Heysham, and Bewick, when recording ornithological occurrences in the 'Courier.' I mention these matters because had the late Mr. M'Diarmid been an ordinary newspaper editor (I use the term with due reverence for the Fourth Estate!) the paragraphs given below would not have been entitled to any particular credence in a matter of this kind. The first notice of Ptarmigan is in the 'Courier' for August 26th, 1823, and I quote the entire paragraph:—

"Natural History. — We have just seen and examined a very beautiful bird, shot by Mr. Murray, of Broughton, on the 18th current, and which appears to be quite a nondescript in ornithology. The following is a correct description:—In size, form, and weight, the same as a well grown grouse, with the roughness of the feet and claws, and red fleshy ring above the eye, that belong to that species. Plumage beautiful, and totally different. Colour of the back and breast, a light brown, tinged with yellow;

wing-feathers unspotted, and of a dingy white or *blae* colour. This curious bird is evidently neither a partridge, a grouse, or a ptarmigan, and yet it has several points of resemblance to all three; and may peradventure be a cross betwixt either of them. But the Ptarmigan, which is white in winter and grey in summer, scarcely ever visits the low grounds; and indeed the general opinion is that this bird which lingered long about Cairnsmuir of Carsphairn, is now entirely rooted out of Galloway. Of late years it has never been seen; but the severity of last winter brought many feathered fugitives to our doors; *and we know an individual in Sanquhar, who obtained, last season, no fewer than ten brace of Ptarmigan, which were eagerly purchased by stuffers and persons curious in ornithology.* Wolves, wild boars, and all those animals that fly before the march of civilization, and seem exorcised by the woodman's axe, can be easily spared, and are well out of the way; but to us, 'the universal feathered people' are so truly interesting, that we never wish to see a single bar in their escutcheon, or a twig severed from the beautiful family tree."

There is a reference again to the same occurrence contained in the following notice of the capture of a Bittern, recorded in the 'Courier' for February 21st, 1826:—

"The bittern, or miredrum, is so seldom met with in the south of Scotland that it was supposed by many to be totally unknown, but although the extension of tillage and other causes have compelled this and other bipeds to return to wilds 'where things that own not man's dominion dwell,' the chapter of accidents or the severity of the weather is every now and then throwing a solitary specimen in the fowler's way. The tremendous snowstorms of 1822 brought whole flocks of wild swans to our shores, *and during the same period three or four brace of Ptarmigan were killed somewhere above Sanquhar*, although the opinion had become prevalent that not one of these birds existed among the highest hills of Dumfriesshire and Galloway. Some of the ptarmigans were sent to our townsman, Mr. Shanks, to be stuffed, and we have just been informed that Mr. John Lewars has a brace of young ptarmigans alive and so tame that they run about the doors like domestic fowls. *These birds were brought, we understand, from the English side, and were probably hatched on the top of Skiddaw.* But our object in lifting the pen at present is to state that a fine bittern of the largest size, and the first we have heard of for a long time, was shot last week on the estate of Broompark, which stretches almost to the side of the Nith, and is within a few minutes walk of this town. This bird, which we have seen, is obviously a cock, with very bright plumage, considering its colour, and has been finely stuffed by Mr. Hellon, at Messrs. J. Kerr & Coy's."

It will be seen there is a difference in the number of brace said to have been taken, but the main interest of this paragraph centres in the passage concerning the young Ptarmigan from Cumberland. That the writer, who was beyond doubt M'Diarmid himself, comprehended the importance attached to the capture of Ptarmigan is well shown in the following words occurring in an article contained in the 'Courier' for November 29th, 1828:—

"To us few things are more agreeable than a day spent among the mountains of Scotland; and hence our *penchant* for exploring every loch and cleuch, where a trout leaps, an eagle soars, a *ptarmigan lingers, the last of its race*, or a bittern, derned in some solitary marsh, beats his hollow drum as the night closes in."

In the 'Courier' for May 14th, 1833, in describing a curious variety of the Black Grouse, the specimen mentioned in a paragraph above quoted is again referred to in the following terms:—

"Some years ago Mr. Murray, of Broughton, shot a bird which the best judges considered a cross between the Red Grouse and Ptarmigan."

We may now dismiss the specimen in question with the remark that, after all, it seems to have borne a suspicious resemblance to a Ptarmigan in the lavender-tinted autumn plumage. I have failed to discover any trace of the person who captured the birds "above Sanquhar"; but the gamekeeper at Wanlockhead, who has been fifty years a keeper in the district, says he had heard that some Ptarmigan in the Dumfries Museum were killed near Wanlockhead. The Museum was established in 1835, but the catalogue of the contents, printed in 1843, does not mention any Ptarmigan. There were two old specimens in the Museum, however, that had been there for over forty years. It is a painful reflection to me to know that these were thrown to the rubbish-heap by myself three or four years ago, being then so much moth-eaten and moulded, owing to a long course of neglect, that they were barely recognisable as Ptarmigan. I am convinced, from enquiries made into their history, that they were really two of the birds captured near Sanquhar in 1822, and there is every reason to believe they were presented to the Museum by Mr. M'Diarmid himself. He was one of the projectors of the Museum, and for many years afterwards took a keen interest in promoting its welfare. The late Duke of Buccleuch introduced Ptarmigan near Sanquhar about twenty-five years since, but they immediately disappeared. This is, I believe, the only attempt that has been made to re-stock any part of the hills in Galloway and Dumfries with these interesting birds.

Hartfell and District. — The same remark I made about the absence of oral traditions of Ptarmigan in the district surrounding the Lowthers has also to be made in the case of the locality under notice. Mr. Roy, Secretary of the Moffat Naturalists' Field Club, has most obligingly made enquiries for me in that district, but with only a negative result. There are two printed records of Ptarmigan in Moffatdale. One of these is contained in the 'New Statistical Account' (Moffat Parish, 1835, p. 108):—"Ptarmigan are very rarely seen." The other record is that of Sir W. Jardine ('Game Birds,' 1834, p. 172), the same passage being repeated *verbatim* in his 'British Birds' (vol. iii., p. 95):—"According to Pennant, and some contemporary writers, these birds were found on the hills of Westmoreland and Cumberland; and, I believe, recollections even exist of a few having been seen upon the high ranges which appear on the opposite border of Scotland. These have been for some time extirpated, and unless a few solitary pairs remain on Skiddaw, or some of its precipitous neighbours, the range of the Grampians will be its most southern British station." No precise locality is here named, but "the high ranges" on the border of Scotland "opposite" to Cumberland can only be the Moffat Hills.

I think I have in the preceding pages succeeded in showing that Ptarmigan were natives of the South-west of Scotland until near the end of the first quarter of the present century. During my enquiries I have never heard the slightest hint that the Ptarmigan that used to live on our hills might have been white or particoloured specimens of the common Red Grouse. The suggestion in question is of such a nature that it is not easily disproved, but I look upon it as a rather gratuitous complication introduced into an otherwise very interesting piece of historical ornithology. But when we find that on nearly all the outlying stations of the present race of Ptarmigan in Scotland, such as in Arran, in Argyle, and the Outer Hebrides, these birds are decreasing and on some places have even become extinct, and that on many of the high inland ranges they are also known to be diminishing in numbers, their extinction on the Scottish and English borders over half a century ago is not surprising. When they were on the mountains of Dumfriesshire and Galloway there is no improbability, but the reverse, that they were also at the same time native to the Cumbrian mountains. The English hills are within easy sight from all the higher peaks on our ranges; and there can be no question that the former are high enough, and in other respects suited to be the abodes of these feathered children of the mist.

THE DISTRIBUTION IN GREAT BRITAIN OF THE LESSER HORSE-SHOE BAT.

By J. E. Kelsall.

As a supplement to the editorial remarks on Horse-shoe Bats in 'The Zoologist' for January last, and encouraged by the further observations of Lord Lilford (p. 62), I have collected all the records that I have been able to find of the occurrence of the smaller species, *Rhinolophus hipposideros*, in Britain, being able, thanks to the kindness of many naturalists, to add a few which have not before been printed. As the Editor truly remarked, the larger species, *R. ferrum-equinum*, is found only in the southern and western counties; its distribution may be summarised as "England south of the Thames (from Kent to Cornwall) and South Wales." Its Welsh localities have not been mentioned before in 'The Zoologist': they are the Mumbles near Swansea, in Glamorganshire ('Field,' Jan. 1, 1881), and the Old Wogan, a partly natural, partly artificial, cave, which adjoins Pembroke Castle, where it has been found by Mr. James Tracy, of Pembroke. In the same article it was stated that the smaller species also was chiefly restricted to the southern counties of England, but the following records will show that its range extends much more to the north and west than that of its congener, and not so far eastward.

In the south-western corner of England it is frequently met with: for Cornwall I may quote Couch (Zool. 1853, p. 3941).

[See also Couch, 'Cornish Fauna,' part i. p. 6, and Cocks, 'The Naturalist,' vol. i. p. 37.—Ed.] For Devonshire, see Montagu, Trans. Linn. Soc. vol. ix. p. 163, and Lord Lilford, in last month's 'Zoologist' (p. 63). [See also Bellamy, 'Nat. Hist. South Devon,' p. 193; Brooking Rowe, 'Cat. Mamm., &c., Devon,' p. 3; W. Borrer, Zool. 1874, p. 4129; D'Urban, 'Handbook S. Devon,' Append. p. xxvi. (1875); and Parfitt, 'Fauna of Devon' (1877), p. 17.—Ed.]

Somerset is given as a habitat in Jenyns' 'Manual,' and the venerable author has kindly written, in answer to my inquiry, that it is frequent in the neighbourhood of Bath, the specimens in the Museum there having been taken in a stone-quarry together with the larger species; and that "many years back" he received others taken in churches in Bristol. The Rev. M. A. Mathew also informs me that he has taken *R. hipposideros* in a cave at Uphill, near Weston-super-Mare, "some years ago." For Dorsetshire we have again the authority of Jenyns' 'Manual of British Vertebrates' (p. 20).

In the Isle of Wight Mr. H. Rogers, of Freshwater, who knows the larger species, and feels sure that he is not mistaken in the identification, tells me that one specimen of *R. hipposideros* was taken about twenty years ago at Niton; but it must be uncommon in the island (perhaps a recent immigrant?), as it was never discovered there by Mr. A. G. More, nor by any other good observer who has lived there. [*R. ferrum-equinum*, on the other hand, is the commonest large Bat in the Undercliff; *cf.* More in Venables' 'Guide to the Isle of Wight,' p. 409; and W. Borrer, Zool. 1874, p. 4129.—Ed.]

It was in Wiltshire that it was first discovered, by Montagu, to be a British species. (Linn. Trans. ix. p. 163).

[Worcestershire.—Dr. Hastings, in his 'Illustrations of the Nat. Hist. Worcestershire' (1834), includes (p. 62) "the large Horse-shoe, *Rhinolophus ferrum-equinum*," but not the lesser species.—Ed.]

Gloucestershire and Warwickshire were added by Mr. Tomes in the second edition of Bell's 'British Quadrupeds' (1874), though it cannot be considered common in the latter county, since Mr. Tomes mentions only two localities for it—Welford, and Ragley near Alcester. In the former county it is stated to be not rare at Cirencester.

[Staffordshire.—The Lesser Horse-shoe Bat is not mentioned by Garner in his 'Nat. Hist. of the Co. Stafford,' but Mr. J. R. Masefield, in a paper on 'The existing Indigenous Mammalia of North Staffordshire,' includes it as occurring near Burton, on the authority of Mr. Edwin Brown.—Ed.]

It is remarkable that these counties appear to form the south-eastern limit of this Bat in England. On the Hampshire mainland ten other species have been met with, in Sussex nine, not counting Mr. Borrer's specimens of the Serotine (Zool. 1874, p. 4126), in Kent eight, and the same number in Essex (where Mr. Laver is well acquainted with seven); and yet neither Mr. Bond, Mr. Borrer, Mr. Laver, Mr. Rope, nor Mr. Southwell seem to have met with *R. hipposideros* in any district to the south-east of those I have named; indeed, Mr. Laver, in his "List of the Mammals of Essex" ('Trans. Essex Field Club,' vol. ii. p. 162), states that he does not believe either species of Horse-shoe Bat occurs in the district, which is strong negative evidence, considering the large number of Bats which have passed through his hands. I should be glad if any reader of 'The Zoologist' could suggest a reason for its absence from the south-east corner of England: it can scarcely be for want of natural caverns, since it has often been taken in buildings. Leisler's Bat, an arboreal species, appears to be similarly restricted in its range.

But passing to the north and west we find distinct, if fragmentary, evidence of a much wider range than that of the larger species.

Wales is mentioned as a habitat in Jenyns' 'Manual of British Vertebrates,' although, as the author informs me, he does not now remember from what county he heard of it; but Mr. Storrie, of the Cardiff Museum, tells me that he has found it near Bridgend, Glamorganshire; and Mr. Tracy, of Pembroke, states that he has frequently taken it at Stackpoole, Pembrokeshire. A more vague report from Denbighshire I have yet to investigate. [Donovan found a living specimen of this Bat amongst the ivy overhanging the mouldering battlements of Raglan Castle, Monmouthshire (Brit. Quadrupeds, pl. ii.).—Ed.]

In Herefordshire it has been taken over the kitchens at Sufton Court, as recorded by Mr. R. M. Lingwood (Ann. & Mag. Nat. Hist. 1840, p. 185).

For Derbyshire we have the evidence of Sir Oswald Mosley, in his 'Natural History of Tutbury,' that he received many specimens from "the calcareous caverns of Dovedale and Matlock," and believed it to be dispersed over the whole of the limestone districts of the county.

In Nottinghamshire Mr. Whitaker has not met with it, but Mr. J. Ray Hardy, of the Manchester Museum, informs me that he picked up a dead one from the ground at Edwinstowe, in Sherwood Forest, years ago, "too far gone to make a good specimen." In sending me two Irish specimens he observed that if these are rightly named (as they certainly are) the Nottinghamshire specimen was identical with them.

For Yorkshire we have the authority of Messrs. Roebuck and Clarkson for its occurrence in a cave at Eavestone, near Ripon (see Zool. 1882, p. 186, and 1884, p. 173), and at Pateley Bridge ('Naturalist,' 1886, p. 339); and for Cheshire, Byerley's 'Fauna of Liverpool,' where we learn that one was taken at Storeton Quarry, near Birkenhead, about 1834.

Renfrewshire apparently marks its northern limit. In Dr. A. R. Young's 'Statistical Account of Renfrewshire,' Crookston Castle in that county is mentioned as a locality, but the late Mr. Alston, in his 'Fauna of the West of Scotland' (p. 7), expressed his opinion that some mistake had been made in the identification.

The discovery of this Bat in Galway and Clare was referred to in the editorial remarks above mentioned, and Mr. A. G. More informs me that he has himself taken it in some numbers, in the former county, in a cave at Coole Park, near Gort, the seat of Sir W. Gregory.

Thanks to the kindness of Mr. Ray Hardy, I am glad to be able to record the occurrence of *R. hipposideros* in the county of Kerry, namely, at Muckross, near Killarney. "Both males and females were common," he writes, "flying about the old Abbey by hundreds." He says:—"It was in July, 1885: I got the stable-man to let me go into the hay-loft at Mr. Herbert's stables at Muckross, where they hung from the beams above in great numbers. With my butterfly-net I could have taken ten at one stroke, and the excrement between the joists of the floor was half an inch deep; I measured it carefully. I only got one specimen of the curious parasite, *Nycteribia hermanni* (*N.*

biarticulata, Westwood), though I looked on scores." This description of their haunt agrees very well with that given by Mr. Tomes in Bell's 'British Quadrupeds.'* Mr. Hardy has lent me two of his Irish specimens, one of which measures 9⅓ in. between the tips of the extended wings, without unnatural distention. I have a white specimen from the collection of the late Mr. Slopur, of Devizes.

On two females of this Bat, taken by Mr. Ingleby in the Red Hole, Eavestone, near Ripon, on Christmas Day, 1885, I found two specimens of an orange-coloured *Acarus* (on the margin of the ear of one of them) and two of a *Nycteribia*, since identified by reference to Prof. Westwood's paper in the Zoological Society's 'Transactions' (vol. i. p. 292) as *N. biarticulata*, Hermann. The same parasite was found upon this Bat by Donovan. Perhaps in hybernation the parasite gains more completely the upper hand. In 'The Zoologist' for 1861 Dr. Kinahan speaks of this Bat as infested with a large and "disgusting-looking" tick; and the position of the *Acari* agrees with that of those found on a *Barbastelle* by Mr. Gurney, as described in 'The Zoologist' for 1847.

In one of the books I have lately consulted it was mentioned that this Bat carried its tail over its back, as is shown in the figure of the Greater Horse-shoe Bat given in 'The Zoologist' for January. [This observation is made by Couch (Zool. 1853, p. 3941). In the Noctule, on the contrary, the tail is tucked under it, just as a dog puts its tail between its legs. Two living specimens now before us, as they hang suspended, look as if they were tailless.—Ed.]

In conclusion, while thanking the many naturalists who have answered my inquiries, whether able to help me or not, I may say that I should be glad to hear of any new locality for this Bat, or any British species other than the Pipistrelle, the Long-eared, and the Noctule. I feel sure that if readers of 'The Zoologist' were to furnish the results of their experience they could put on record a better account of the distribution of these obscure animals in Britain than is at present to be found in any published work.

---

* According to Dr. J. R. Kinahan the sexes hybernate apart. See an interesting article by him entitled "Three days among the Bats in Clare," 'Zoologist,' 1861, pp. 7617-7624.—Ed.

NOTES ON A VOYAGE TO THE GREENLAND SEAS IN 1886.

By Robert Gray.

(Continued from p. 57.)

A continuation of northerly winds, strong generally to the force of a gale, had not the effect, as might naturally be supposed, of causing any remarkable change in the position of the ice. Beyond a certain limit it continued to remain close and impenetrable. No blueness of the western sky indicated open water and invited approach; all in that direction presented a uniform and dazzling whiteness, sea and sky! Along the edge of this impenetrable mass, however, a belt of navigable ice, extending seawards some fifty miles, was gradually formed. In this area we continued cruising in search of whales. Floes and fields lay scattered about in careless-like confusion with packs and streams of broken-up ice; Polar bears were seem almost daily, stalking about on the ice-fields, doubtless attracted by the vast numbers of Floe-rats (*Phoca hispida*). Narwhals were in hundreds to be seen almost at all times more or less abundant. Looms and Rotches there were without number, Dovekies (*Uria grylle*), Puffins (*Fratercula arctica*), Snow-birds, Burgomasters, Kittiwakes (*Rissa tridactyla*), were also numerous; the sea was generally grass-green in colour, and always contained an abundance of the various forms of Entomostraca, Pteropoda, Gasteropoda and Medusidæ, &c., which go to constitute the food of the whale. Nothing in fact was wanting to complete a perfect resort for the Greenland Right Whale, its food was in abundance, the surroundings were apparently congenial to its habits, and still more, the time it was when these animals are wont to frequent this part of the Arctic Seas for a considerable period.

June 5th. Spoke the s.s. "Erik." Capt. A. Gray told us that on the 3rd inst., in lat. 79° 15′ N., 2° 30′. E., a large Finner (*B. sibbaldii*) was seen for several hours, feeding amongst the ice near his ship, *accompanied by two calves*.

June 6th. Saw three whales*; one of these we captured, a small bull (5 ft. 2 in. bone). Although a small animal its rump was quite grey. I found the spaces between the laminæ of baleen to measure three-eighths of an inch; the length of the "hair" attached to their inner margins 12 in., the thickness of the blubber on the body 8 in., at the neck decreasing to 6 in. towards the tail.

---

* It is scarcely necessary to explain that when the word "whale" is used *B. mysticetus* is implied.

June 8th. Narwhals numerous with their young.

June 11th. A flock of Brent Geese (*Bernicla brenta*), consisting of at least forty birds, seen flying westward, very low, across the ice. Large flocks of these birds are to be seen here about this time, flying in a similar direction every season. Therefore, if not an open Polar sea, yet sufficient open water must break out annually beyond the "barrier" to warrant the migration, not only of these birds, but also (as has already been said) of *Balæna mysticetus* towards it. The same day, while reaching eastwards from the edge of the close-ice, we passed over a number of strips of water, alternately blue and green.

June 12th. While sailing southwards along the edge of the close-ice, in company with the "Erik," a whale was seen coming towards us from the S.E. Both vessels hauled to and lowered their boats. The whale continued its course to the N.W., towards the close-ice, six boats following in hot pursuit. Owing to the competition between the two ships it soon became evident that all caution, all rules being laid aside, the chase would either prove a failure, or rashness would win the day. Reaching the edge of the close-ice, the "fish," which hitherto had been swimming at a rate of five miles per hour, now relaxed its speed and began playing about. The first boat up would get a chance! Towards it all the boats directed their course, every oarsman pulling his very utmost; a boat from each ship led the way; neither had the advantage; they were rapidly approaching within shot; the harpooners stood to their guns, when the two boats steering for the same object rapidly closed with one another and unavoidably came into collision. The whale meanwhile had dived, soon afterwards it reappeared, again the boats were almost within shot, again it dived to reappear once more before finally dipping under a floe. This time one of our boats pulled right on to its back, and the harpooner, depressing the gun, would undoubtedly have got fast, had not the gun unfortunately snapped. One of the "Erik's" boats had by this time fired, but not being within range (20 yards) the "foregoer" tightened and the harpoon fell short. The whale, a young animal, undoubtedly long ere this fully conscious of being pursued, at this juncture seemed to forget itself, for moving too far forward, it allowed its under jaw to become shelved on a "tongue" of ice. Quickly backing astern, however, the animal very soon cleared itself and immediately dived under the ice, a small round floe. The whale could now only be regarded as "scared," and the chase virtually at an end. Nevertheless, as a slight hope remained of the animal again making its appearance, the boats took up stations round the floe and patiently waited. Thirty minutes elapsed without its reappearing, already some of the boats were returning to their ships; forty minutes had just elapsed, when at the very same place where it had first disappeared the animal was seen coming out below the ice. All the boats were by this time returning on board, but the last one to give up the chase—fortunately yet at no great distance,—saw the whale and immediately returned. Thereafter the others followed, and the whale was eventually harpooned by one of the 'Erik's' boats. Immediately when harpooned the animal dived, taking out line with great rapidity, and descending almost perpendicularly downwards. Meanwhile the boats took up positions about the place where they expected the "fish" to reappear. The whale having ran out about one mile of line, and having probably descended to a depth of over 500 fathoms, returned to the surface some thirty minutes after being harpooned. Several boats being at hand, second and third harpoons were successively "fired in." The whale now set out along the surface, at a rate of some six miles per hour, towing, however, four heavy whale boats behind it. Swimming between wind and water, it continued for some time to throw itself bodily forward, half of the animal appearing above water, falling into the sea again with a dreadful splash, at the same time rolling off one side on to the other as it advanced forward; the pectoral fins as they alternately appeared above water were raised erect, the tail was also frequently exposed. At length becoming quieter in its movements and slower in its speed, some of the boats succeeded in getting up and endeavoured to lance. Their efforts, however, were on almost every occasion frustrated by the animal turning upon the boats and violently pushing them away with its head. A number of oars were broken and more than one boat narrowly escaped being capsized. Subsequently the whale received a fourth harpoon, when, throwing its tail high in the air, it disappeared. The boats were patiently waiting its reappearance, many with some of their oars broken, all the seamen more or less drenched. Suddenly, but slowly and steadily, the animal's tail was seen rising vertically upward, close alongside one of the boats; having reached a certain height, it commenced to descend with equal slowness, rubbing against the boat's gunwale all the while, until at length it sank out of sight. A few minutes afterwards the animal quietly floated up to the surface dead.

June 13th. Life very abundant, Narwhals and Floe-rats being particularly numerous. Four Bears were shot, and several others were seen; of the former two were mother and young, the latter, however, so large as to be scarcely recognisable as a cub. The same evening, while two of these bear-skins were towing astern, a Narwhal was noticed following in the wake; after examining the bear-skins it seized hold of one of them with its mouth and commenced tugging at it, and if it had not been for a timely rifle-bullet would undoubtedly have succeeded in tearing the skin to pieces.

June 19th. Laying in a small "bight" in the ice-edge, where we have been for several days. Narwhals have been very abundant, visiting us regularly every morning, being always most numerous about 4 a.m. A few Arctic Terns, *Sterna hirundo*, seen in the morning. At night we passed a small land-bird resembling a Snipe sitting on a piece of ice.

June 21st. A heavy point of ice, which, hitherto remaining close and impenetrable, had extended over a considerable portion of the whaling-banks, now broke up and we were enabled to reach this part of the ground. The water, although blue and clear, contained a very great abundance of whales' food, *Calanus finmarckicus*. Narwhals were playing about in hundreds; here also had been the Greenland Right Whale quite recently and in no inconsiderable numbers. This we were led to believe from the quantities of "blowings" (mucous discharges from the spiracles of whales) which were lying about everywhere on the surface of the sea. Some of these blowings still shed a film of oil around them, and appeared to be of no great age. More convincing still, perhaps, amongst it there was found the hard shell of that particular kind of parasite which is occasionally found infesting the whale. An easterly swell, the cause which had been so effective in destroying this point of ice, had been equally effective in breaking up into pack-ice the floes lying to the westward. To the refuge so formed the whales had undoubtedly retreated, and most likely were still lying there perfectly secure from attack.

Although undoubtedly ice-loving in its habits before the interference of man, the Greenland Right Whale, having there no enemy to fear from which it had not the power to escape, wandered seawards in quest of its food, which in many seasons, owing to the position of the ice, is to be found there in the greatest abundance. Certainly it found a resort in the bays and fiords of Spitzbergen, which in the stillness of their recesses closely resembled the "polynias" of its native ice-fields. Although necessarily in some seasons many miles from the Greenland west ice, from the margin of which I conceive it to have strayed, *Balæna mysticetus* nevertheless annually visited the bays and fiords of the western coast of Spitzbergen, but only, I presume, a visit in its duration and date coincident with its appearance at the west margin of the west ice in "North Greenland," as already described. The effect of the interference of man will now be easily understood. In the bays and fiords of Spitzbergen it was first found, there it was first harpooned, and from thence, as being farthest from its home, by continued persecution it was first driven. To the west ice it was followed, there the persecution was continued, the animal became still more timid in its habits, still more anxious of its safety, the bays and deep recesses along the margins of the ice became less frequently visited, and the Greenland Right Whale, avoiding open water as dangerous, regarded the heave of the ocean's swell as the signal to retreat, and thus preferred to remain amongst the close-ice, knowing that while there it was secure beyond the reach of its enemies. In short, *Balæna mysticetus* was originally so ice-loving in its habits, that its annual migrations were formerly the same as at present, but that by long and continued persecution it has become considerably more timid and cautious in its habits, which, together with the great reduction in its numbers, brought about by the same means, it first ceased to visit the west coast of Spitzbergen, its appearance in the open sea became an occurrence of increasing rarity, until at length the open bays along the margin of the ice have almost ceased to be visited, and the Greenland Whale of the present day seldom leaves the protection afforded by the close-ice. Further, that the extent of sea covered by ice broken up by the action of swell ("pack-ice") and impenetrable to ships is in most seasons of vast extent, and if to this area be added the polynias or open spaces of water, large and small, which there is every reason to believe break out amongst the floes, the former only at certain times and in certain places, the latter perhaps always and everywhere, it will be seen that with whatever zeal and perseverance its persecution is continued, an area of sufficient extent will always remain unpenetrated, in which the Greenland Whale, enjoying immunity from attack, will continue to exist in sufficient numbers to remove the possibility of its ever becoming exterminated; and that its present apparent exceeding scarcity in the Greenland Seas is to be ascribed to the seclusiveness of its habits and its preference to remain amongst close impenetrable ice rather than to the species becoming extinct.

June 24th. One Great Skua, *Stercorarius catarrhactes*, seen; also a small bird about the size of a Swallow, with a reddish throat and brown wings.

June 25th. Sailing southwards along the ice-edge, the wind light from the eastward, a really dreadful swell from the S.E. running. The 'Erik,' then in our company, at the distance of only half a mile, was being taken completely out of our sight, masts and all, as she sank in the trough of the sea; a strong gale from the S.E. had recently been blowing. The effect of such a swell on the neighbouring ice is to be imagined rather than described; at a distance of four or five miles the noise was sufficiently appalling to forbid nearer approach. 6 p.m., being in lat. 78° 10′ N. and long. 1° W., a Chimney Swift, *Chætura pelasgia*, was noticed sitting on one of the yards. A seaman went aloft, and finding it asleep brought it down in his hand. The bird was very much exhausted—in fact, almost dead. I suppose it had been carried across from Norway by the recent gale. A few Arctic Puffins seen; they are not common so far from land. The North Greenland whaling was now over for the season, and we were steering southwards along the ice-edge towards the South Greenland whaling-grounds. These lie to the southward of the 75th parallel of latitude and to the eastward of the coast of

Greenland; it may also be added that this region is limited to the southward and eastward by the ice-edge, and that the South Greenland whales are generally killed to the westward of the meridian of Jan Mayen, and to the northward of the 70th parallel. The fishing is extremely uncertain; in some seasons the ice is so far to the eastward as to prevent the ships getting within several hundreds of miles of the ground, in others it is so far west that the swell is able to reach the ice lying on the ground, and convert it into an impenetrable pack, and thus, although the ships are able to reach the locality, unless the winds prevail from the S.W. and keep the ice open, they are almost as helpless as before. If, however, the ice is not too far to the eastward, and is navigable as far west as the ground, whales are occasionally found here in comparatively great numbers, and good cargoes are sometimes obtained. The appearance of whales so far south at this time of the year, apparently in direct contradiction to their migration northwards earlier in the season, as already stated, is somewhat difficult of explanation. It may, however, be interesting to know:—(1) That the greater proportion (about 90 per cent.) of the whales killed here are full-grown males; (2) that they have been followed south-westwards from the North Greenland grounds, from which they are frequently seen departing about the month of June; (3) that this class of old whales sometimes never migrate northwards, and consequently remain on the South Greenland grounds during the whole season (May to September); (4) that in some years the South Greenland grounds are completely deserted early in the season, or at any rate no whales are seen there during the summer. The ice undoubtedly plays a most important part in influencing these migrations, but the exact manner in which this is effected has yet to be explained.

[With the concluding portion of this article we hope to give, in our next number, a good figure of *Balæna mysticetus*, from a careful drawing by Capt. David Gray.—Ed.]

(To be continued.)

BELOSTOMIDÆ AND OTHER FISH-DESTROYING BUGS.

By George Dimmock.

Insects are generally considered to be beneficial to fishes by furnishing them one of the most unfailing sources of food. There are, however, a few insects which are injurious to fishes, thus making an exception to the rule. DeGeer published a statement, in 1774, that the larvæ of dragonflies (Libellulidæ) would seize and kill fishes, a statement confirmed by Dale in 1832. Von Mützschefahl, in 1778-79, mentions several aquatic insects which attacked the Perch, among them two species of water-beetles (Dytiscidæ) and two species of water-bugs (*Notonecta glauca* and *Nepa linearis*, now called *Ranatra linearis*). The destruction of young fishes by water-beetles has since been noted by Elles in 1830, by Dale in 1832, and by Riley in 1885. In regard to the water-bugs, observations published within the past few years have not only confirmed the above-mentioned earlier statements, but other bugs have been discovered to attack fishes. Leidy, as early as 1847, writes that species of *Belostoma* and *Perthostoma* (*Zaitha*) prey upon fishes. Glover, in 1875, states that *Ranatra quadridenticulata* and *Belostoma americanum* feed on small fishes, and that *Nepa apiculata* probably, and *Notonecta insularis* possibly, do the same. Milner, in 1876, writes that *Belostoma grande* captures and eats fishes. Miss Ormerod, in 1878, describes how *Ranatra linearis* attacks fishes; the same year Peck called attention to the destruction of the eggs of Carp by the same insect. Turner, the next year, mentions the killing of young Sticklebacks in an aquarium by *Belostoma*. Leonard notices the showing, at the Edinburgh Fisheries Exhibition in 1882, of a preparation by Hugh D. McGovern, of Brooklyn, N. Y., of a year-old Trout, "surmounted by the fish-eating bug, *Belostoma grandis*," which was in the act of killing the fish by piercing its head; and Todd, the same year, describes how a *Belostoma*, about three-quarters of an inch long, was seen to vanquish a fish three or four times its own length. Uhler, in 1884, states that *Ranatra* destroys the eggs of fishes, and sometimes attacks the young fishes themselves and sucks their blood. Writing of *Belostoma grande*, the giant species of this genus, that is found in tropical America, he states that, "It is a formidable monster in the pools of Demerara, where it lurks on the bottom of the muddy pools which match its colour, ever ready to grasp the unwary fish in the cruel embrace of its sharp hooked fore-legs, there to remain fixed until life becomes extinct with the outflow of its blood." This author adds, "Scarcely less rapacious are the species inhabiting the United States. One of these, *B. grisea*, is the facile master of the ponds and estuaries of the tidal creeks and rivers of the Atlantic States. Developing in the quiet pools, secreting itself beneath stones or rubbish, it watches the approach of a *Pomotis*, mud-minnow, frog, or other small-sized tenant of the water, when it darts with sudden rapidity upon its unprepared victim, grasps the creature with its strong, clasping fore-legs, plunges its deadly beak deep into the flesh, and proceeds with the utmost coolness to leisurely suck its blood. A copious supply of saliva is poured into the wound, and no doubt aids in producing the paralysis which so speedily follows its puncture in small creatures."

That the loss of fish due to these insects is considerable seems quite probable, because, notwithstanding their secluded habits, they are not rarely to be seen about ponds, sometimes even in the act of taking fishes. The following quotation from a letter from Mr. E. A. Brackett, of Winchester, Mass., Chairman of the Commissioners on Inland Fisheries for Massachusetts, under date of Dec. 16th, 1886, will illustrate this fact. He writes, "In October last, while drawing off the Carp-pond, the water became very roily, and I noticed several young Carp moving on the surface, sidewise, evidently propelled by some external force. With a dip-net I took these young fish out, and found that in every case they were firmly held by a water-bug. The fish were dead, and the bugs apparently had been feeding on them. I had no means of determining how many of these bugs were in the pond."

The largest, and without doubt the most dangerous to fishes, of these water-bugs, are those which belong to the family, Belostomidæ. It is especially of these Belostomidæ that this paper treats. In the north-eastern United States the common forms of these bugs belong to the genera, *Zaitha*, *Belostoma* and *Benacus*. The form of insects belonging to the genus *Belostoma*, is elongated oval, and their considerably flattened form and large size, serves to distinguish them from all the other before-mentioned water-bugs, except those belonging to the genus

Nepa, and from them they are easily distinguished by the fact that the body of *Nepa* terminates in a long tube formed by the apposition of two grooved appendages; through this tube the insect obtains air for breathing, while the species of *Belostoma* have no such tube. The form in *Zaitha* is like that of *Belostoma*, but the species are smaller. In *Benacus*, another closely allied genus, of which the sole species, *B. haldemanum*, is found in the United States, the femur of each fore-leg lacks the groove on its forward side,—a groove which is present in the species of *Belostoma*, and which serves for the partial reception of the tibia when the fore-leg is folded up. The genera *Zaitha* and *Benacus* formerly were considered to be a part of the genus *Belostoma*.

Insects of the family Belostomidæ are abundant in nearly all parts of the tropical and temperate zones of both hemispheres, except in Europe, where they are extremely rare; but, as a general rule, these insects are larger the warmer the climate in which they live. Individual specimens of *Belostoma grande* are sometimes found in tropical America, which measure four inches in length, and *B. griseum*, which is found in the northern United States, attains a length of three and a half inches. The young of this species when only two days from the egg measured, according to Packard, a third of an inch in length.

The colour of the species of Belostomidæ is brown, of a greater or less depth, or of a yellowish or a greenish shade. Partially covered with mud, they are difficult to discover. The sexes are not easy to distinguish from one another, except that females can at times be distinguished by the eggs which they carry.

These large insects are not only provided with powerful fore-legs which they use to seize their prey, and strong, somewhat oar-shaped hind-legs for swimming; but, when full-grown, they have strong wings and are capable of long-sustained flight. By their flights, which, as in most aquatic Hemiptera, take place at night, these insects pass from one pond to another. This insures them a wide distribution, and makes their extermination a difficult matter. Living, as they often do, in pools which dry up at certain seasons of the year, this provision for flight is a necessity of their existence. That these flights are often long and high is proved by the fact that the bugs have been found in the midst of large cities, far from any pond or pool, upon the roofs of three and four story blocks. It is probable that they are found in these situations from having been attracted to the reflecting surfaces of sky-lights, for it is well known that water-beetles, with their imperfect sight, mistake large expanses of glass, such as are presented by greenhouses, for sheets of water. Especially attractive, however, to these large water-bugs are electric lights, and notices have appeared in the daily press of the swarming of these, as well as other insects, about the electric lights of cities. In flight, as Mr. Brackett states in the letter from which I have already quoted, the species of Belostomidæ which he observed can rise directly from the surface of the water.

These insects differ, according to the species, as to their mode of egg-laying. Some, like the common *Zaitha fluminea* of our northern waters, lay their eggs on their own backs. In my collection I have a specimen of this species, which has her back almost entirely covered by a nicely-arranged layer of elongated-oval dark-brown eggs, which number over 175. These eggs are set nicely upon one end, and placed in transverse rows, by means of a long protrusile tube, or ovipositor, which the insect can extend far over her own back. This mode of oviposition insures the safety of the eggs until the young are hatched, The eggs are fastened to the back of the mother by a very thin layer of a waterproof gum secreted by the insect. The entire layer of eggs is apt to split from the insects when they are dried, and consequently is rarely seen in collections of insects. The young bug hatches from its egg by means of cutting out a round lid from the top of the egg, and, at about the time when the young brood begins to hatch, the mother sheds the entire layer of eggs from her back, something as she would moult her skin during growth. It is probable that all the species of *Zaitha* carry their eggs about with them, while, on the other hand, some, if not all, the species of *Belostoma* deposit their eggs in masses, under boards and logs, near the margins of the pools which they inhabit.

The young, upon hatching from the eggs, go immediately on their predaceous course, often feeding at first on young snails. As is true of most Hemiptera—the bugs properly speaking—the young differ little from the adults except in the absence of wings in the former. In *Belostoma* the young, however, have two claws on the tarsi of the fore-legs, while as adults they have only one tarsal claw in the same place. It is not certainly known, but it is likely that these insects reach their full growth in a year.

In seizing upon fishes or other small animals these insects grasp their prey with their fore-feet, holding it firmly in their claws, then piercing it with their beak or proboscis; for they only suck blood, not being able, as is the case with water-beetles, to eat the whole animal. The proboscis consists of stout horny setæ or bristles, which fit closely together to form a fine sucking-tube, while the exhaustion is performed by means of a muscular, extensible pharynx, or throat. As is probably the case with all carnivorous Hemiptera, only living prey is acceptable to these insects. The predaceous water-bugs are said to destroy the eggs of fishes, although further confirmation of this statement is desirable.

When the water-bugs attack other animals it is noticeable that the prey dies much quicker than it would normally do, from simply the loss of blood consequent upon the sucking of the bug, so it is generally supposed that these insects inject a poisonous secretion through their proboscis into the wound they make. Most of these insects inflict severe stings in self-defence, if they are handled too freely, using the proboscis for this purpose. Leidy has described the salivary glands of *Belostoma*, which are well developed (Journ. Acad. Nat. Sci. Philad. 1847, p. 57), and it is the secretion of these glands that poisons the prey when pierced by the proboscis.

To destroy the bugs that attack fishes is not an easy matter. The water-beetles can be trapped by the use of decaying animal matter, of which they are very fond. I have seen a dead rat in a small pond surrounded by a great number of these beetles (Dytiscidæ), and they prefer such food to living prey. On the other hand, the water-bugs will take only living food, so that their entrapping by any bait would be difficult.

The use of poison for aquatic Hemiptera seems also impracticable. Water-bugs are so much hardier than fish, that nothing dissolved in the water would injure them that would not prove dangerous for the fish.*

---

* Abridged from the 'Annual Report of the Fish and Game Commissioners of Massachusetts, 1886.'

NOTES AND QUERIES.

Death of Mr. Robert Gray.—The name of the author of 'The Birds of the West of Scotland' will be well known to our readers, who, we feel sure, will hear with regret of his death, which took place in Edinburgh on February 18th. The son of a merchant in Dunbar, Mr. Gray early in life entered the service of the City of Glasgow Bank, where he rose by his ability to the position of Inspector of Branches. It was during his journeys through the country in that capacity, and especially in the Western Highlands, that he obtained much of the information about birds which he afterwards published in his work above named. From the position of Inspector of Branches he was promoted to be Manager of the West End Branch of the City of Glasgow Bank in Glasgow, which position he occupied until he accepted (about twelve years ago) the post of Superintendent of Branches of the Bank of Scotland. After having filled that appointment for some years, he became Cashier to the Bank at their head office in Edinburgh, and in that capacity he has ever since been well and favourably known. He was a Vice-President of the Royal Society of Edinburgh, and Secretary to the Royal Physical Society. To naturalists his name will be best known by his little book 'The Birds of Ayrshire and Wigtownshire' (1869), in which he was assisted by Mr. Thomas Anderson, and his larger and more important work, 'The Birds of the West of Scotland,' published in 1871, and it is to be regretted that he did not live to carry out the project which he had in hand of bringing out a second edition of this, and of publishing, in conjunction with Mr. W. Evans, of Edinburgh, a companion volume on the Birds of the East of Scotland.

MAMMALIA.

Dormice in a Garden.—Some Dormice took up their abode last year in an old Blackbird's nest in this garden. The nest was placed in a thorn bush about eight feet from the ground. The Dormice showed themselves readily on the trunk near the nest on the tree being tapped; but soon after their discovery they disappeared altogether, owing, I am afraid, to their being too constantly visited.—E. P. LARKEN (Gatton Tower, Reigate).

Bats in Captivity.—On the 17th January I found a dead *Vespertilio pipistrellus*, without any external injury, in the fork of a laburnum tree, about four feet from the ground. It had evidently come out from its winter retreat and succumbed to the cold. I once captured one of these small Bats in my bedroom on the 27th August, and it lived in captivity for nearly three weeks. I fed it on flies and moths, the latter of which it relished the most. It was very partial to raw meat, which it devoured ravenously when presented to it. I tried the experiment of putting butterflies into its cage, but these it never touched. At the beginning of August last I discovered a colony of the species *V. noctula* in a hollow branch of a sycamore tree. In order to ascertain their species I resorted to the method of smoking them out with brown paper; upon the smoke reaching them they came scrambling out of their aperture gnashing their little white teeth like so many furies, and making a great squeaking. More than a dozen succeeded in making good their escape before I captured one, owing to the awkward position of their abode. There were numbers of others in the hole, but directly they appeared at the aperture and saw me, they beat a hasty retreat, and nothing would induce them to venture forth again. The one I caught I placed on the lawn to test the accuracy of the common assertion that "Bats rise with much difficulty from the ground," and was much surprised with what ease it took wing. It scrambled about a foot along the turf, then rose in the air, and was soon lost to sight, being in no wise confused by the sun, which was then shining brilliantly. This species is very common about the Vale of Aylesbury.—F. HAYWARD PARROTT (Walton House, Aylesbury).

BIRDS.

On the Wing-spur of the Coot, Moorhen, and Water Rail.—On examining a nestling Moorhen a year or two ago I was surprised to find a perfect hook or claw at the extremity of each of the bastard wings. With the exception of the new edition of 'Yarrell,' and 'The Naturalists' Library,' no ornithological work in my posssesion makes mention of this fact. The allusion in Yarrell's 'British Birds' is as follows:—"Moorhen. Wings . . . armed with a small sharp recumbent spine." Jardine states:—"*Gallinula.* Generic characters: wings . . . carpal joint armed with a spine." Neither of these authors even hint at the idea of Coots and Water Rails possessing the spine in either a greater or less degree. In the Moorhen it is white, reflexed (or claw-shaped) and sharp. In the Water Rail it is horn-coloured, straight, and blunt. What is its true use or *raison d'être?* The Horned Screamer, *Palamedea cornuta*, is similarly armed, as is also the Spur-winged Goose, although I am not certain as to the exact position of the spurs in the last two cases. The spine must be intended to serve as a weapon of offence or defence, or may be intended for pacific purposes only,—as a boat-hook; or, as the Moorhen is known to use its wings in diving, these hooks may then be brought into play, or they may be of assistance in keeping the rest of the body submerged when the beak and nostrils only are protruded above the surface of the water to obtain a breath of fresh air "*in rebus adversis.*" Or is this a case of evolution? The "claw" is certainly most rudimentary in the Water Rail, which is the most averse to flying of either of the three birds mentioned. Is it that these birds are now evolving a second pair of legs! or, *vice versâ*, a perfect (*i. e.* a toeless and toe-nailless) pair of wings from a former second pair of feet? Certainly this claw is not a temporary natural appendage such as the nib on the beak of a newly-hatched chick, or the tail and two-chambered heart of the tadpole. What then is its use?—MAURICE C. H. BIRD (West Rudham, Norfolk).

[Our correspondent should read an article "On the Claws and Spurs on Birds' Wings," by Mr. J. A. Jeffries (Proc. Boston Soc. Nat. Hist. 1881, p. 301); and another with the same title by Mr. P. L. Sclater, published in 'The Ibis' for April, 1886, pp. 147-151.—ED.]

Note on Eider Ducks.—On reading Mr. A. H. Chapman's article in 'The Zoologist' for January last "On the Habits and Migrations of Wild-fowl," I was especially interested in his remarks on what he calls "a most extraordinary feat performed by Eiders" (p. 13). On firing at the leading bird of four flying in company all dropped to the shot, although only the first was killed. During my stay of two years (1881–3) in Arctic Alaska, with the U.S. Signal Service Expedition to Point Barrow, I had ample opportunity for observing the habits of a different species of Eider, the King Eider, *Somateria spectabilis*, very abundant in that locality during the migrations, and frequently observed a somewhat similar performance. I have made a brief reference to this observation in my report on the birds of the expedition (Report U.S. International Polar Expedition to Point Barrow, 1885, p. 120). The King Eiders, when migrating northwards, pass Point Barrow during May and June in enormous flocks. They have already paired before reaching the Point, and travel (to quote my words in the passage referred to) in "pairs, flying alternately, ducks and drakes. If a duck is shot down, the drake almost invariably follows her to the ice, apparently supposing that she had alighted." In such cases the drake drops so suddenly that more than once we were deceived when shooting Eiders, and, running in to pick up our two birds, were surprised to find the drake, who was sitting flat on the ice with his head up like a wounded bird, suddenly "pull himself together" and make off unhurt, before we could collect our senses sufficiently to secure him with the second barrel. Dr. Leonhard Stejneger, of the U.S. National Museum, who spent a year on Behring Island, informs me that he has witnessed a similar performance by Steller's Duck, *Eniconetta stelleri*. I had supposed that this peculiar feat was only performed by paired birds, but Mr. Chapman's observation goes to show that other influences than those of sex may induce the Eiders to indulge in this extraordinary game of "follow my leader."—JOHN MURDOCH (U.S. National Museum, Washington, D.C.).

Partridges with white "Horse-shoes."—When shooting, on the 20th September, just over the Northamptonshire boundary, I shot a Partridge which had the horseshoe pure white, with the exception of a spot or two of faint chestnut at the upper end, imperceptible until the feathers were lifted.

It was a bird of the year, having almost completed its moult. For two or three years I have noticed that the birds on a certain farm in Oxfordshire, not far from where the bird in question was killed, have a good deal of white mixed with the ordinary chestnut of the horseshoe, and the proportion of white seems to be increasing year by year, some birds killed this season showing about an even amount of white and brown. The bird shot the other day is, however, the first I have ever heard of about here with a quite white mark. The first of this variety I ever saw was sent to a stuffer in Banbury in 1879, and was killed, I believe, in Bedfordshire; it was considered a great rarity. In Nottinghamshire, Mr. Whitaker tells me that the birds with white horseshoe are often met with, but the abundance of Partridges in that county would partly account for this. Mr. Whitaker has skins of some curious dark-coloured birds, also procured there.—Oliver V. Aplin (Bloxham, near Banbury, Oxon).

Usefulness of the Rook in destroying Caterpillars.—A notable instance of the usefulness of the Rook has recently come under my own observation in Sutton Park. During the summer almost every oak tree in the woods is stripped of its leaves by the larva of a lepidopterous insect known to lepidopterists as *Hybernia defoliaria*, and locally known as the Oak or Autumn Moth. The imago of this insect makes its appearance during the autumn and winter months, from the end of September to the middle of January. The males, in the daytime, may be seen at rest on the trunks of trees, generally in great abundance; but the females, which resemble spiders, are seldom observed, because they effectually hide themselves in the crevices of the bark and under leaves, and only stir about at night, when they deposit their eggs. In April the young caterpillars hatch and crawl up the branches of the trees, commencing at once to devour the buds as they open. As the leaves expand they grow correspondingly, until they reach the length of a little more than an inch. After a shower of rain or a little wind thousands of these caterpillars, becoming alarmed, let themselves down by their webs, and remain suspended for hours in mid-air swinging to and fro in the breeze. Everyone going through the woods during the months of May and June experiences the unpleasantness of constantly coming into contact with their webs, and the incessant itching of the hands and face occasioned thereby. Indeed to many persons this annoyance causes them to avoid the woods during this part of the year. The caterpillars continue to feed until about the middle of July, by which time they have stripped nearly every oak tree of its leaves, and caused it to look as if winter had overtaken it. During the last few years these insect-pests have not contented themselves with stripping the oaks, but have attacked indiscriminately mountain ash, bilberry, brake fern, and all low-lying vegetation. No artificial means could effectually cope with such a wide area as the one attacked. The only remedy is to let Nature take her own course. Immediately after the breeding-season Rooks, with their newly-fledged young, fly off to the woods, where they remain for several weeks, where amongst these caterpillars they obtain an abundance of food without any trouble. All day long these birds may be seen, in company with large flocks of Jackdaws and Starlings, busily engaged on the tops of the trees devouring the grubs. Last year a visible decrease was made in their numbers, judging from the decrease in the number of moths that emerged in the autumn. This year the caterpillars have been much less plentiful; but some allowance must be made for the numbers destroyed during the wet which was experienced in the early spring.—W. HARCOURT BATH (The Limes, Sutton Coldfield, near Birmingham).

Albino Birds observed in the Harrogate District.—During the last few years albino specimens of some of the commoner birds have been of frequent occurrence. Those which have come under my notice in this district are the following:—An albino Blackbird for the last three years frequented Harlow Moor, and a perfectly white specimen was obtained at Harewood. A pied House Sparrow for some months frequented Parliament Street, one of our main thoroughfares. In the summer of 1884 Mr. J. Simpson shot a pure white albino Sky Lark at Birk Crag. Mr. J. Heaton, also during the same year, shot in the fields adjoining the Hydropathic Establishment a smoky white Starling, the bill and legs of which were of the same colour. On the 3rd of January last Mr. R. Wood (Oatlands, Harrogate) informed me that he had on the previous day observed in his stackyard a pied Robin, the back and tail of which were perfectly white, the remaining parts being of the usual colour. — J. R. FITZGERALD (Harrogate).

Habits of the Green Sandpiper.—That the Green Sandpiper, *Totanus ochropus*, occasionally winters in this country is well known to most ornithologists. The reason for its not doing so more frequently seems in no way connected with the severity of our climate or the scarcity of food, as the following notes will show. In December, 1885, the Green Sandpiper was quite plentiful on most of our "becks" and drains, though we had several days of severe frost early in the month. Throughout the great snow storm which commenced on March 1st, 1886, a few remained in the district up to the middle of the month. Last summer they arrived rather later than usual,—I saw the first on July 27th,—but were very abundant about the middle of August. On the 23rd of that month I flushed over a dozen from our stream in a distance of less than a mile, and they have been by no means uncommon up to the present time. On the night of December 1st a thermometer placed on the ground showed twelve degrees of frost; on December 2nd, twenty-one degrees; and on December 3rd, nine degrees; yet the Green Sandpipers remained, and appeared perfectly at home and comfortable. Again, from the 17th of December to the 7th of January the frost continued with very little intermission and some heavy falls of snow, but the Green Sandpipers seemed totally unaffected by it, not even losing their customary wildness, and generally flying a long distance when disturbed. I seldom shoot these birds, but those I have examined, killed in winter, were always in good condition. The Snipe apparently felt the recent long-continued frost much more than the Green Sandpipers, those I killed being in very poor condition. They lay exceedingly close, and when flushed only flew a short distance slowly and heavily, offering the easiest of shots.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

Crossbills at Rynn, Rosenallis, Queen's County.— On Sept. 23rd a flock of Crossbills visited a belt of spruce-fir trees near the house, perching on the fir-cones and pecking out the seeds, twittering and throwing down the cones in numbers. On Sept. 24th Mr. Croasdaile shot three out of the flock, one reddish cock with a fine large bill, one yellowish cock, and a hen; the two cocks were sent to Messrs. Williams, Dame Street, Dublin, to be stuffed. Many of them broke off the cones from the branches, and carrying them close to the stem of the tree pecked out the seeds there. They kept up a constant twittering and chirping, and sometimes one of the cock birds would sing a short song from the top of a spruce. They had young ones with them, which they fed while perched on the branches of the firs, and were still at Ryme on October 30th.—ANNA CROASDAILE (Ryme, Queen's County).

Little Bustard in Sussex.—A fine specimen of the Little Bustard, *Otis tetrax*, was shot in a turnip-field by Mr. Coote, at Clymping, near Arundel, Sussex, in October last. Photographs have been obligingly forwarded me by Mr. Hobgen, of Chichester, placing the identity of the species beyond a doubt. It has been well preserved by Mr. Henry George, taxidermist, of that town.—PERCY E. COOMBE (23, Carlyle Square, S.W.).

Varieties of Common Wild Ducks.—Two very beautiful varieties (duck and mallard) of the Common Wild Duck were caught last December in the decoy at Park Hall. The mallard had the head and neck white, a green patch under each eye and one or two on the back of the head; back white, with a band of dark grey between wings; wing-coverts grey-brown; wings white; tail with two white curled feathers, the others of the normal colour: thighs salmon-colour; breast white, crossed with a band of a salmon-grey colour. The duck was a pale slate-colour, each feather edged with bright chestnut; the wings dark slate-colour, with the speculum very pale grey, edged with white at the top.—J. WHITAKER (Rainworth Lodge, near Mansfield, Notts.).

Thrush nesting on the Ground.—On the 13th May I saw four Thrush's eggs in a slight depression on the ground under a hedge, with no nest except a few oak-leaves. The eggs were quite warm; and so they were three days later, when I saw the bird fly from them. I did not take any, because I wanted to give them every chance of being hatched; but on the 18th they had disappeared.—F. H. Birley (Dorman's Land, East Grinstead).

Plumage of the Tufted Duck.—When passing through the Metropolitan Market on January 15th I found to my surprise a male Tufted Duck, *Fuligula cristata*, in which the forehead was sprinkled with white feathers. The late Mr. Yarrell recorded a female Tufted Duck, in which the forehead was "speckled with white like the adult female of the Scaup." I examined two female Tufted Ducks at Lewes in which the forehead was white; these birds were known to be eight years old. An adult female living in the collection of the Zoological Society at present has likewise this variation; but I am not aware that the *male* Tufted Duck has been recorded to exhibit this Scaup-like tendency. Since the foregoing was written, Mr. J. H. Gurney, jun., has pointed out to me that the assumption of a white forehead by the Tufted Duck is not necessarily a sign of old age, since "there is a very young Tufted Duck in the Wolley Collection at the Norwich Museum, which has a white face." Mr. Gurney adds that a female Tufted Duck in his collection, shot on August 8th, shows a trace of the white forehead. Perhaps Mr. Whitaker, whose opportunities for studying the Tufted Duck have been so exceptional, may be able to throw further light upon this point.—H. A. Macpherson.

Plumage of the Kestrel.—In 'The Zoologist' for 1883, p. 496, I communicated the result of some observations made by my brother and myself on the plumage of the young Kestrel, and it was there implied that the tail of the adult female was rufous with dark bars; this I find is not exactly correct. Since the above note was written I have obtained two specimens, both females by dissection, in which the tail has a strong tinge of blue. One specimen has the upper tail-coverts blue, with a faint tinge of the same colour on the tail, the other has the tail so decidedly washed with blue that the ground colour might be called blue rather than rufous, although there is still a rufous shade. In both birds the tail is barred in the character of the younger and rufous-tailed female, instead of having the upper aspect clear blue, with the exception of a broad subterminal dark band as in the adult male. I may add that the dark bars on the tail of the adult male are only seen when the feathers are spread or reversed; they exist on the inner webs only, and gradually disappear with age. In a very old pale specimen in my possession these dark markings are obsolete in some of the feathers, and appear in the shape of spots in others. To return to the adult female: in my opinion fully adult birds always possess more or less blue upon the upper tail-coverts and the tail, and I am unable to agree with Mr. J. H. Gurney, jun., who, in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. iv. pt. ii. p. 155), refers to some examples of female Kestrels showing more or less blue colouring, and treats them as instances of the females assuming male dress. I think the bird mentioned by the Rev. H. T. Frere in 'The Zoologist' for 1886 (p 180), and described as "a young male in immature (female) plumage, with the exception of a few blue feathers on the upper tail-coverts," was really (unless actually sexed) the female bird of the pair, a very old bird in the adult bluish dress, and not a second male paired to the female belonging to the nest in two hours, as he suggests. With regard to Mr. Cecil Smith's remarks, in 'The Zoologist' for 1886 (p 110), I would submit that his No. 1 is (unless actually sexed) not a male at all, but an example of the fully adult female. In addition to the evidence of the colour and markings of the tail, Mr. Smith's description of the tail-coverts being "distinctly barred with dark brown," and "the feathers on the breast and rest of the upper parts" having "broad patches of dark brown towards the tip, and also dark brown bars nearer the body," all tend to this conclusion.—F. C. Aplin (Bloxham, near Banbury, Oxon).

Supposed assumption of Male Plumage by a Female Kestrel.—If the Kestrel mentioned by the Rev. H. T. Frere (Zool. 1886, p. 180) was not dissected, and if it was judged to be a male because it had blue feathers on the upper tail-coverts, this affords no proof that such was the case; for it is by no means uncommon for the female Kestrel to assume this colour. The specimen No. 8 described by Mr. Cecil Smith (*tom. cit.* p. 112) is a case in point.—J. H. Gurney, Jun. (Northrepps, Norwich).

Hybrid Finches.—At the recent Crystal Palace Cage-Bird Show (Feb. 12th to 17th) an unusual number of hybrid finches were exhibited. Of course the usual mules between Goldfinch, Linnet, and Canary were common enough, but besides these there were fifteen Siskin-Canary, one Redpoll-Canary, and one Bullfinch-Canary mules, the last two being very rarely seen. There were also the following hybrids between other finches, *viz.*:—one Greenfinch-Linnet, one Greenfinch-Goldfinch, one Linnet-Bullfinch, one Linnet-Goldfinch, five Goldfinch-Bullfinch, one Redpoll-Bullfinch, and one Redpoll-Linnet. In this list the male bird is in every case placed first. The most beautiful of these hybrids was the Goldfinch-Bullfinch, the colours and the shape of the bill of each species being completely blended. It is apparently not difficult to obtain such hybrids, for some have been exhibited at every show for many years. To my mind the most remarkable bird at the recent show was the Redpoll-Bullfinch, the disparity in size of the parents being so great. I do not doubt that all the above named were bred as described, but there was a bird shown as a Siskin-

Greenfinch which appeared to me to be a Cape Canary, *Serinus canicollis*, and as the specimen of that species taken at Brighton (see Zool. for February, p. 72) was also exhibited by Mr. Swaysland, I was enabled to make a minute comparison between the two, and Mr. Swaysland concurred in my view. I would not, however, put forward this opinion too positively, for I have seen an undoubted hybrid between a Redpoll and Linnet so closely resembling the Twite that it could scarcely be distinguished from that species, and had I not known the person who bred it (Mr. J. H. Verrall, of Lewes), I could scarcely have been convinced that such was not the case; indeed I believe that if the bird had been taken wild it would certainly have been regarded as a Twite.—J. Jenner Weir (Beckenham, Kent).

[A hybrid between male Redpoll and female Bullfinch is noticed by Rev. H. A. Macpherson (Zool. 1883, p. 504), where mention is also made of hybrids between Goldfinch and Bullfinch, Bullfinch and Linnet, Linnet and Lesser Redpoll, Goldfinch and Siskin, and Bullfinch and Goldfinch.—Ed.]

White's Thrush in the Scilly Islands.—Early in December last the butler of Mr. Dorien-Smith killed at Tresco, Scilly, a bird which he thought to be a large Missel Thrush. Fortunately he showed it to Mr. Smith, who at once sent it on to Mr. W. H. Vingoe, of this place, with whom I saw it. It is unmistakably a specimen of "White's Thrush," of the ordinary size and plumage.—Thomas Cornish (Penzance).

FISHES.

Scabbard Fish on the Cornish Coast.—Early in this month Mr. Fortescue Millett obtained from the sea-shore near Marazion the head and part of the body of a Scabbard Fish, *Lepidopus argyreus*, washed ashore. He kindly showed it to me, and I have no doubt that its identification is correct. I believe that this is the first recorded occurrence of this fish in Mount's Bay.—Thomas Cornish (Penzance).

[This fish was first described as British by Montagu (Mem. Wern. Soc. i. p. 82, pls. 2, 3), from a specimen obtained in Salcombe Harbour, Devon. We believe it has only been met with on the south coast of England.—Ed.]

MOLLUSCA.

Muscular Power of Snails.—Seeing the remarks on the wonderful strength of snails (Zool. 1886, p. 491) reminds me of what came under my observation many years ago, of which a note was made and a sketch taken. On the 7th of April, at 9 a.m. (ther. 46°), I noticed a cluster of hybernating Snails, *Helix aspersa*, that had taken up their quarters in a rough garden-wall; two or three of those near the opening had slightly relaxed their hold since the previous day. On the 9th, at 9 a.m.. I found one on the move; there had been rain during the night, and the thermometer had risen to 50°. Later in the day a Snail was observed coming out with one tightly adhering to its shell, seemingly not much hindered or retarded by it till it began to ascend the face of the wall, where a slight twig barred the way, which the burdened Snail could neither get under nor over. After a close inspection of the obstacle and its surroundings it began to creep up the slender twig, which was gradually enveloped and good progress made till a projecting ledge had been reached, to surmount which it had to relax its hold of a part of the twig, causing the pendant load to oscillate and drag away the greater part of the body, which, drawn out to great length, swung to and fro like a pendulum. How this mishap was to be got over I was at a loss to imagine, and momentarily expected to see the Snail come toppling down, but it held on tenaciously, and ere long began to contract its attenuated body till, bit by bit, it had regained its hold of the stem, and ere night had succeeded in overcoming all obstacles. But for this marvellous muscular power many Snails might perish, seeing that the first which revive have to tear themselves away from the agglutinated mass, and are not unfrequently heavily laden as described.—HENRY HADFIELD (Ventnor, Isle of Wight).

Marine Mollusca of Kerry.—In the last volume of 'The Zoologist' (p. 418) I described the various forms of inland Mollusca sent to me by the Rev. A. H. Delap from the neighbourhood of Valentia, and now proceed to give some account of the marine species collected, which are both numerous and interesting. Most of the species were taken in Valentia Harbour, and the following is a list of those from that locality:—*Anomia ephippium*, *A. patelliformis*, *Pecten varius*, *P. maximus*, *P. opercularis*, *P. pusio*, *Modiolaria discors*, *M. marmorata*, *Arca tetragona* (curiously worn and distorted by the rocks, as described in 'British Conchology'), *Tellina tenuis* and var. *alba*, *T. balthica* and var. *citrina*, *T. squalida*, *Psammobia ferroënsis* (and var. *pallida*, without the pink rays), *P. tellinella*, *Vinus ovata*, *V. gallina*, *V. verrucosa*, *Axinus flexuosus*, *Mactra subtruncata*, *Saxicava rugosa* var. *pholadis*, *Mya truncata*, *M. binghami*, *Cardium echinatum*, *C. nodosum*, *Helcion pellucidum*, *Trochus umbilicatus*, *T. cinerarius*, *T. tumidus*, *T. magus*, *T. zizyphinus*, *Lacuna divaricata* and var. *quadrifasciata*, Mont., *Littorina obtusata* var. *lutea*, *L. rudis*, small varieties, one, *pallidula*, 10½ mill. long, pale yellowish, and not strongly ribbed, and two forms of var. *jugosa*, Mont.,—*rubra*, entirely red, and *albagrisea*, whitish grey, with a white band below the periphery and a white base. *Rissoa membranacea*, *R. parva*, type form, *R. striata*, *Odostomia lactea*, *Natica alderi*, *Scalaria communis*, *Nassa reticulata*, *N. incrassata*, *Murex erinaceus*, *Aporrhaïs pes-pelecani*, *Defrancia purpurea*, var. deep chocolate-brown, variegated with white, *Pleurotoma costata*, *Cerithium reticulatum*, *Cypræa europæa* (of two forms, *typica*, pale brownish or pinkish, with or without brown spots, and an ash-coloured variety, spotless or with black spots), *Scaphander lignarius*, and *Acera bullata*. Accompanying the above, also from Valentia Harbour, dredged in six fathoms, was some foraminiferous mud. This has been carefully examined by Mr. C. D. Sherborn, who reports the following species:—*Lagena sulcata*, W. & J. var., *L. lævis*, Will., *Truncatulina lobatula*, Mont., *Rotalia beccarii*, Linn., *Miliolina oblonga*, Mont., *Polystomella crispa*, Linn., *P. striatopunctata*, J. & M., and a species of *Bulimina*. Some very interesting forms of *Purpura lapillus* were sent from Donlus Head. In shape and size they agree with Jeffreys' var. *minor*, and as regards colour may be divided into three races—*a. nigra*, brown-black; *b. bizona*, similar, but with two pale brown bands; and *c. lineolata*, pale yellowish with three white bands and numerous dark brown spiral lines. Bally-na-Skellig Bay yielded *Kellia suborbicularis* and *Helcion pellucidum* var. *lævis*, specimens of the latter being beautifully iridescent with purple inside. Finne Strand was the locality of specimens of *Actæon tornatilis* and *Donax vittatus* sent; and from Darrynane Strand were sent *Corbula gibba*, and *Phasianella pullus* of five varieties—*a. millepunctata*, regularly and minutely spotted with pink; *b. cinereolineata*, with brown-band and some rather ill-marked grey, closely set interrupted lines; *c. interrupta*, with a dark interrupted lines; and two other less marked forms. This completes the list of Kerry shells sent by Mr. Delap, and though necessarily incomplete it is of some interest as a contribution to the fauna of a little-worked district, and more especially for comparison with other local lists, and its bearing upon the question of geographical distribution. It is to be hoped that before long we shall know in some detail the local distribution of our marine fauna, but at present the materials are far too scanty to form any definite conclusions or for any considerable generalizations. With the Kerry collection were three species from Donegal—*Spirula peronii*, Lam. (*S. australis*, Brug.) from Maghery Strand, and *Fissurella græca* (a small depressed form, perhaps var. *ima*, De Greg.), and *Emarginula fissura* from Rutland Island.—T. D. A. Cockerell (Bedford Park, Chiswick).

CRUSTACEA.

Inachus dorynchus at Penzance.—On February 17th I obtained from the stomach of a codfish, caught in Mount's Bay, five specimens of *Inachus dorynchus*, one a large male measuring fourteen-sixteenths of an inch on the lengthwise of the carapace, and the others (females) much smaller, and all bearing berry. They were all more or less covered with sponges, *Fuci*, and small corallines. In the male the rostrum was obscurely bifid, but in all the females it was distinctly so. In all of them the colour was reddish brown, and in each the fingers were marked by transverse darker coloured bars. The specimens were perfectly fit for observation, but too far gone for preservation.—Thomas Cornish (Penzance).

[For a figure of this species see Bell, 'British Stalk-eyed Crustacea,' p. 16.—Ed.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 3, 1887.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

Dr. Michael C. Grabham (Oporto) and Capt. Wingate (Cashmere) were elected Fellows of the Society.

Mr. W. Simpson exhibited a series of sketches of the Afghan Boundary, as illustrative of the region traversed by the Delimitation Commission.

An important paper on the Fauna and Flora of the Afghan Boundary, by Brigade-Surgeon J. E. T. Aitchison, C.I.E., was read and discussed. Among the speakers who took part in the discussion were Sir J. D. Hooker, Dr. Günther, Mr. G. A. Boulenger, Dr. P. L. Sclater, Mr. W. T. Blanford, Mr. O. Thomas, Sir J. Fayrer, Mr. R. Bowdler Sharpe, Mr. Howard Saunders, Mr. C. O. Waterhouse, and others. The following is the author's summary of the zoological collections:—Nineteen species of mammals, belonging to fifteen genera, were collected, and other species belonging to three genera were seen. Perhaps the most interesting, as being the least known, was *Ellobius fuscicapillus*, the type of which was originally obtained many years ago near Quetta. The geographical range of the Tiger, *Felis tigris*, was now ascertained to include the district round Bala-Morghab, and that of the Cheetah, *Felis jubata*, as far as the valley of the Hari-rud; while the Egyptian Fox, *Vulpes famelica*, was obtained as far north and east as Kushk-rud, and Kiu in the basin of the Harut river. As regards birds, 123 species belonging to some eighty-four genera were collected, while fourteen other species were identified, though not preserved. Two new species only were procured, *viz.* a Pheasant, *Phasianus principalis*, and a Woodpecker, *Gecinus Gorii*. The birds in Afghanistan are chiefly migratory, with the exception of the above new Pheasant, the Raven, Rook, Carrion Crow, Jackdaw, Sparrow, Starling, Sky Lark, Crested Lark, Bokhara Lark, *Melanocorypha bimaculata*, Wall Creeper, *Tichodroma muraria*, Bittern, *Botaurus stellaris*, several Raptores, Sand Grouse, *Pterocles arenarius*, and Red-legged Partridge, *Caccabis chukar*. As spring advances birds are seen to arrive, following each other rapidly, such as *Aedon familiaris*, and various species of *Sylvia*, *Saxicola*, *Lanius*, *Motacilla*, *Pastor*, *Merops*, and *Coracias*. Various ducks then leave the country, but the Brahminy Duck or Ruddy Sheldrake, *Casarca rutila*, remains throughout the year and breeds there. The greater number of the species met with belong to the genera *Saxicola* (8), *Lanius* (6), *Sylvia* (5), *Motacilla* (5), and *Emberiza* (4). Of Reptilia thirty-five species were collected—a Tortoise and twenty-one species of Lizards, of which three are new; of Ophidians thirteen species, one of which is new; also adult examples of *Naia oxiana*, which heretofore has only been recognised from young specimens. Of Batrachia two specimens were obtained, viz. *Rana esculenta* and *Bufo viridis*, and on the latter a Leech, *Aulostoma gulo*, was found. Circumstances prevented more than seven species of fish from being procured; these proved to belong to six genera: two of these species are new to science. *Schizothorax intermedius* is interesting, as it was found by Griffith in the Cabul river, an affluent of the Indus. In the great eastern drainage of East Turkestan it was found at Youngsi-Hirsar by the second Yarkand Mission. The new species of *Schizothorax* was only met with in the Hari-rud and its tributaries. Over one hundred species of insects were collected, of which twenty prove new. The greater number of them are typical of the Arabian, North African, and Mediterranean faunas; a few only have Indian and Central Asian affinities. It was observed that the Lepidoptera generally appeared at irregular intervals, only when there was perfect stillness in the air, and then in limited numbers.

February 17. 1887.—The only zoological paper read at this meeting was by Dr. Hoek, of Leiden, "On *Dichelaspis pellucida*, Darwin, from the scales of an Hydrophid obtained at the Mergui Archipelago by Dr. John Anderson." As far as the author's knowledge goes, this species of Cirripede has not been observed since Darwin published his description from specimens procured in the Indian Ocean and also from a sea-snake. It seems that although somewhat larger in dimensions, and with other slight variations which may be due to difference of age, there can be little doubt of the identity of the Mergui specimens with Darwin's *D. pellucida* (Monogr. Cirriped. i. p. 125).—J. Murie.

Zoological Society of London.

February 1, 1887.—Dr. St. George Mivart, F.R.S., Vice-President, in the chair.

Mr. F. Day exhibited and made remarks on a hybrid fish supposed to be between the Pilchard and the Herring, and a specimen of *Salmo purpuratus* reared in this country.

Mr. W. L. Sclater exhibited and made remarks upon some specimens of a species of *Peripatus* which he had obtained in British Guiana during a recent visit to that country, and added some general observations on the distribution and affinities of this singular form of Arthropod.

Mr A. Thomson read a report on the insects bred in the Society's Insect House during the past season, and exhibited the insects referred to.

A communication was read from Dr. B. C. A. Windle, containing an account of the anatomy of *Hydromys chrysogaster*.

Mr. Martin Jacoby read a paper containing an account of the Phytophagous Coleoptera obtained by Mr. G. Lewis in Ceylon during the years 1881, 1882. About 150 new species were described and many new generic forms.

Mr. F. E. Beddard read some notes on a specimen of a rare American Monkey, *Brachyurus calvus*, which had died in the Society's Gardens.

Mr. Oldfield Thomas read a note on the Mammals obtained by Mr. H. H. Johnston on the Camaroons Mountain.

A paper was read by Capt. Shelley, containing an account of the birds collected by Mr. H. H. Johnston on the Camaroons Mountain. The collection contained thirty-six specimens referable to eighteen species, and of these four were new to science.

Mr. G. A. Boulenger read a list of the Reptiles collected by Mr. H. H. Johnston during his recent visit to the Camaroons Mountain.

Mr. Edgar A. Smith read a paper on the Mollusca collected at the Camaroons Mountain by Mr. H. H. Johnston, and gave the description of a new species of *Gibbus*, proposed to be called *Gibbus johnstoni*, of which specimens were in the collection.

A communication was read from Mr. Charles O. Waterhouse, containing a list of some coleopterous insects collected by Mr. H. H. Johnston on the Camaroons Mountain.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 2, 1887.—Dr. D. SHARP, President, in the chair.

The President nominated Mr. Robert M'Lachlan, F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Mr. Henry T. Stainton, F.R.S., Vice-Presidents during the Session 1887-1888.

The Rev. W. J. Holland, M.A., of Pittsburgh, United States; Dr. F. A. Dixey, M.A., Fellow of Wadham College, Oxford: Mr. C. J. Gahan, M.A., of Brompton, S.W.; and Mr. Sydney Klein, F.R.A.S., of Willesden, N.W.; were elected Fellows.

Mr. P. Crowley exhibited a new species of *Synchlöe*—*S. Johnstoni*—from Kilima-njaro; also, for comparison, specimens of *Synchlöe mesentina* and *S. hellica*, which the new species closely resembled.

Mr. W. White exhibited a number of preserved larvæ of European Lepidoptera in various stages of growth,—including nine examples each of *Saturnia carpini* and *Deilephila euphorbiæ*,—illustrating the gradual development of the markings and colours, as explained by Prof. Weismann, in his 'Studies in the Theory of Descent.'

Mr. Gervase F. Mathew exhibited a variety of a female of *Lycæna telicanus*, from the neighbourhood of Gallipoli, Turkey: also some specimens of a *Lycæna* from Vigo, believed to be varieties of *Lycæna baton*, but differing from the type in being much larger and darker. He further exhibited several examples of a *Leucophasia* from Vigo, which appeared to be identical with *L. æstiva* (Staud.).

Mr. Porritt exhibited, on behalf of Mr. N. F. Dobrée, a series of a remarkable red form of *Tæniocampa gracilis*, bred last season from larvæ collected in Hampshire.

Mr. Eland Shaw exhibited specimens of *Pachytylus cinerascens* (Fab.), *Mecostethus grossus* (Linné) and *Gryllus flavipes* (Gmel.), and read a "Note on the Identity of *Gryllus* (*Locusta*) *flavipes*, Gmel."

The Secretary read a communication from Prof. Riley, of Washington, on the subject of the "Australian Bug" (*Icerya purchasi*). It was stated that the insect had of late years become very destructive to various trees and shrubs in California, into which country, as well as into New Zealand and Cape Colony, it had been introduced from Australia, where it was believed to be indigenous; but on this point further evidence was asked for.

The Rev. T. A. Marshall communicated "A Monograph of the British Braconidæ," Part 2, being a continuation from Part 1 of the 'Transactions' for 1885.

Mr. Francis P. Pascoe read a paper entitled "Descriptions of some new species of *Brachycerus*."

Mr. Francis Galton, F.R.S., read a paper on "Pedigree Moth-breeding as a means of verifying certain important Constants in the General Theory of Heredity." In this paper Mr. Galton suggested the institution of a system of experimental breedings, to be continued for several years, with the object of procuring evidence as to the precise measure of the diminution of the rate at which a divergence from the average of the race proceeds in successive generations of continually selected animals.

Mr. Frederic Merrifield read a paper (by way of an appendix to Mr. Galton's paper) entitled "A proposed method of breeding *Selenia illustraria*, with the object of obtaining data for Mr. Galton."

Mr. M'Lachlan said he considered the fact that *S. illustraria* was dimorphic an objection to its selection for the experiments proposed, and he suggested that the Common Silkworm Moth, or some other large Bombyces, would be more suitable for Mr. Galton's purposes.

Prof. Meldola called attention to some observations on *Selenia illustraria* by Dr. Knaggs, in vol. iii. of the Ent. Mo. Mag., which had some bearing on the projected experiments; and he remarked that although, for some reasons, the species selected was well adapted for testing Mr. Galton's conclusions, he believed that the fact of the moth being seasonally dimorphic was likely to introduce disturbing elements into the experiments which might influence the results.

The discussion was continued by Dr. Sharp, Messrs. Baly, Kirby, White, Klein, Porritt, Dunning, Waterhouse, Bates, Merrifield, Galton, and others.—H. Goss, *Hon. Secretary.*

BRITISH 6 JY 87 M